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**Report to Congress
Pursuant to the FY99 Appropriations Bill**

The FY99 Appropriations Bill states that "the Secretary of Defense shall provide to Congress a report...detailing the security situation in the Taiwan Strait. Such a report shall include an analysis of military forces facing Taiwan from the People's Republic of China, evaluating recent additions to the offensive military capabilities of the People's Republic of China." The Appropriations Bill also further requires assessment of new challenges to Taiwan's deterrent forces, "consistent with the commitments made by the United States in the Taiwan Relations Act, Public Law 96-8."

This report, submitted in response to the FY99 Appropriations Bill, addresses Taiwan's ability to defend against current and emerging PLA capabilities. The report addresses PLA and Taiwan force planning, strategy, and doctrine; projected PLA and Taiwan capabilities in 2005 in the areas of conventional theater ballistic and cruise missiles; information operations (C2W); air and air/missile defense assets; naval systems; special operations and conventional ground forces; and intangibles such as leadership, training, personnel, and morale. The report concludes with a dynamic balance assessment of China's ability in 2005 to implement a naval blockade; establish air superiority; conduct an amphibious invasion of Taiwan; and gain information dominance.

THE SECURITY SITUATION IN THE TAIWAN STRAIT

I. THE SECURITY SITUATION IN THE TAIWAN STRAIT

Nearly three years after the People's Republic of China (PRC) conducted provocative military exercises opposite Taiwan on the eve of that island's first popular presidential election, the security situation in the Taiwan Strait remains calm with no threat of imminent hostilities. There has been little change in the military balance; Beijing has limited its military activity in the region to routine training; Taipei has reduced the size and scope of its military exercises and played down other activities which Beijing might misconstrue as provocative and destabilizing. Within the political arena, senior negotiators from the two quasi-official organizations responsible for managing cross-Straits relations --Taiwan's Straits Exchange Foundation (SEF) and China's Association for Relations Across the Taiwan Strait (ARATS)--met in China in mid-October 1998 and resumed direct contacts--suspended since 1995--aimed at reducing tensions and improving bilateral relations. Although they agreed on future SEF-ARATS dialogue, cooperation, and visits, there was little movement on resolving the more substantive political issues which divide the two sides.

Beijing views Taiwan as a province of China and demands that Taiwan accept the principle of "one China" as a basis for negotiations aimed at eventual reunification. The PRC insists that Taiwan should engage in "political talks" which would set the stage for the island's eventual reunification with the mainland under the "one country, two systems" formula. China also has condemned Taipei's activities aimed at broadening international recognition. For its part, Taipei rejects Beijing's concept of "one China," arguing that China currently is a divided nation and demanding that Beijing deal with Taiwan on an equal basis. Taipei has predicated unification on the condition that China attain levels of economic development and political freedom comparable to those enjoyed on Taiwan; in the interim, Taipei believes that the two sides should focus on "technical" or procedural issues, such as cultural and educational exchanges, law enforcement cooperation, and the resolution of commercial disputes arising from Taiwan's extensive trade and investment interests on the mainland. Taipei also has condemned Beijing's efforts to isolate Taiwan internationally.

Both Beijing and Taipei have stated they seek a peaceful resolution to the reunification issue. Chinese leaders, however, have refused to renounce the option of using force against Taiwan, stating that a formal declaration of independence by Taipei or foreign intervention in Taiwan's internal affairs relative to the reunification issue would provoke China to take up arms against Taiwan. Beijing recently resurrected a third previously stated circumstance, namely, Taipei's acquisition of nuclear weapons.

Taiwan remains concerned over the continuing modernization and professionalization of China's People's Liberation Army (PLA) and the potential threat that it poses to the island's security. Taipei points to the series of military exercises in July 1995 and March 1996 which the PLA conducted opposite Taiwan--exercises that included ballistic missile launches into waters near the island--and the acquisition of advanced weapons systems from Russia, like the Su-27 fighter and the KILO-class submarine, as clear indications of China's focus on defeating Taiwan militarily.

II. DEFENSE STRATEGY AND FORCE PLANNING

Traditionally, China's defense strategy and force planning priorities have been determined by the need to maintain a large armed forces structure capable of responding to a wide range of internal and external missions. This tradition continues to be reflected in China's reliance on a force structure comprised of three elements: the more than 2.5 million member PLA; the one million member People's Armed Police (PAP); and, a reserve-militia component numbering well over 1.5 million personnel. However, in recent years, there has been growing evidence that China's force development strategy is being influenced, in part, by its focus on preparing for military contingencies along its southeastern flank, especially in the Taiwan Strait and the South China Sea.

Over a decade ago, the PLA shifted its strategic focus from preparing to fight a large-scale, "total war" to preparing to fight limited, "local wars." Several developments sharpened the PLA's focus and sense of purpose in preparing for this new kind of warfare. They include the military success of the U.S.-led coalition in the Persian Gulf War; Beijing's perception of an unfolding revolution in military affairs; Chinese suspicions over perceived U.S. efforts to "contain" and militarily "encircle" China; the deployment of two U.S. naval aircraft carrier battle groups near Taiwan during the 1996 missile crisis; and, China's fear that Taiwan was moving toward *de jure* independence. These developments have reinforced China's desire to size and structure PLA forces capable of fighting and winning "local wars under high-tech(nology) conditions."

Although the PLA is still decades from possessing a comprehensive capability to engage and defeat a modern adversary beyond China's boundaries, Beijing believes that the PLA can develop *asymmetric* abilities in certain niches--such as advanced cruise missiles and conventional short-range ballistic missiles (SRBMs).

Asymmetric warfare generally is defined as attacks by a weaker or more technologically backward opponent on a stronger foe's vulnerabilities using unexpected or innovative means, while avoiding the adversary's strengths. China's effort to "leapfrog" generations of technology in weapons programs is often times perceived as an effort to develop new and surprising capabilities, but most of the actual programs are derivative of efforts already well underway in more developed countries. Rather than technological breakthroughs, Beijing's military modernization effort could more accurately be described as a focus on *asymmetric engagement* capabilities. China is seeking to identify innovative tactics and employment parameters for systems and technologies which the PLA has successfully employed or can be reasonably expected to employ in the next two decades.

With respect to Taiwan's defense strategy and force planning priorities, Taipei long ago renounced its intention to "recover" the mainland militarily. Taipei's force development plan focuses on three specific areas: maintaining air superiority over the Taiwan Strait and the waters contiguous to Taiwan; conducting effective counter-blockade operations; and, defeating an amphibious and aerial assault on the island. Taipei hopes that sufficient technological and tactical advantage over the mainland in these areas will buy time for the forces of change in China to render the future political and security landscape more amenable to Taiwan's long-term interests.

Force modernization programs on both sides of the Taiwan Strait are interactive in nature. Just as Taiwan's military acquisitions are intended to address PLA military modernization programs, PRC force planning takes into account emerging capabilities on Taiwan.

III. A COMPARISON OF MILITARY FORCES TO 2005

An Overview of the PLA. Beijing's military modernization program, underway for the past two decades, is designed to prepare the PLA to conduct regional active defensive warfare in support of Chinese economic interests and sovereignty claims--a doctrinal shift away from a focus on the large-scale, land-based guerrilla warfare of Mao's classic "People's War." Chinese doctrine and tactics, however, still bear the indelible mark of Mao's teachings, particularly as they apply to concentration of power by a technologically inferior force at select times and places on the battlefield to overcome a foe armed with superior weapons.

Rather than shifting priority resources from civil infrastructure and economic reform programs to an across-the-board modernization of the PLA, Beijing is focusing on those programs and assets which will give China the most effective means for exploiting critical vulnerabilities in an adversary's military capabilities. This approach potentially will give Beijing the "credible intimidation" needed to accomplish political and military goals without having to rely on overwhelming force-on-force superiority. China's modernization programs thus seek to realize short-term improvements in anti-surface warfare (ASuW) and precision strike and longer term advances in missile defense, counter-space, and information warfare (IW). Concurrently, the PLA is acquiring weapons that would be useful in countering potential adversaries operating on naval platforms or from bases in the East and South China Seas, particularly stand-off weapons such as anti-ship cruise missiles (ASCMs) and long-range land-attack cruise missiles (LACMs), as well as SRBMs. Beijing also is working to address problems associated with integrating advanced weapons systems into their inventory; and weaknesses in command, control, communication, computers, and intelligence (C4I); training; and logistics, so as to improve the PLA's overall warfighting capability.

In comparing PLA and Taiwan military strengths, the PLA has clear quantitative advantages. However, only a portion of the PLA's overall strength could be brought to bear against Taiwan at a given time. Primary forces likely to be involved in an operation directed against Taiwan would include conventional short range ballistic missile units in Jiangxi and Fujian provinces; air and ground force units subordinate to the Nanjing Military Region; and naval assets subordinate to the East Sea Fleet. Depending on operational requirements, however, additional air, naval, ballistic missile, and ground force assets from other parts of China could be involved in operations against Taiwan.

An Overview of the Taiwan Military. For more than a decade, Taiwan's military modernization effort has focused on acquiring modern weapons systems and associated equipment to deter--and, if necessary -- defeat Chinese aggression. Billions of dollars have been spent on domestic programs like the Indigenous Defense Fighter (IDF) and the *Tien Kung* air defense system, as well as on foreign purchases like the U.S.-made F-16 fighter and the French-built Lafayette-class frigate. Many of these newer systems are in the process of being assimilated into the active

inventory. In addition, in the early 1990s, Taiwan's Ministry of Defense publicly announced plans to trim the size of the island's armed forces by 40,000 personnel by 2003, reducing the overall size of the force to around 400,000. Most of the cuts are occurring in the Army, which will number about 200,000. The Air Force and the Navy reportedly will remain at about 60,000-70,000 personnel for each, while the number of personnel assigned to the military police, the coast guard, logistic units and military schools will number between 50,000 and 60,000.

The primary reason for this reduction is to create a smaller army with more mobility and firepower. Another reason is the military's competitive disadvantage in recruiting and retaining highly-trained and technologically proficient personnel to handle modern weapon systems. A third factor is the desire to reduce the number of general officers, especially in the Army. By 2005, Taiwan will have a fighter force of about 400 aircraft and an armor force of about 1,500 tanks. The navy's fleet will number some 30 major surface warships, as older destroyers are phased out of the inventory and replaced with newer combatants. Additionally, the ratio of advanced weaponry to older systems within each of the service inventories will increase.

Chinese Conventional Missiles. As demonstrated in military exercises in the Taiwan Strait in 1995 and 1996, China views its growing conventionally armed ballistic missile force as a potent military and political weapon to influence Taiwan's populace and their leaders. New LACM designs, when operational, will increase China's capability to strike regional targets accurately with conventional warheads. These kinds of weapons systems will play an increasingly important role in modern combat. By 2005, the PLA likely will have deployed two types of SRBMs and a first generation LACM. An expanded arsenal of accurate, conventional SRBMs and LACMs targeted against critical facilities, such as key airfields and C4I nodes, will complicate Taiwan's ability to conduct military operations.

Short-Range Ballistic Missiles (SRBMs). Within the next several years, the size of China's SRBM force is expected to grow substantially. The PLA currently has one regimental-sized CSS-6 (DF-15/M-9) SRBM unit deployed in southeastern China. The CSS-6 is a solid propellant, road mobile missile which can deliver a 500-kilogram conventional payload to a maximum range of 600 km. The CSS-X-7 SRBM—better known by its export designator, the M-11—also is a solid propellant, road-mobile SRBM with an estimated range of 300 km. This missile, however, has not yet entered the PLA's inventory; and an improved, longer range version may be under development. Moreover, both the CSS-6 and the CSS-X-7 are expected to incorporate satellite-assisted navigation technology to improve their accuracy. In an armed conflict with Taiwan, China's SRBMs likely would target air defense installations, airfields, naval bases, C4I nodes, and logistics facilities.

Land -Attack Cruise Missiles (LACMS). China also is developing LACMs. These missiles appear to have a relatively high development priority. Chinese research and development of LACMs is being aided by an aggressive effort to acquire foreign

cruise missile technology and subsystems, particularly from Russia. The first LACM to enter production probably would be air-launched and could be operational early in the next century.

Antiship Cruise Missiles (ASCMs). Technological improvements to the C-801/SARDINE and the C-802/ SACCADe are providing a gradual upgrade to China's current force of antiquated, first generation, CSS-N-1/SCRUBBRUSH ASCMs. Despite the obsolescence of many of its ships, its lack of operational experience and its inability to resupply ASCMs at sea, the PLA Navy could assemble a sizeable ASuW force against Taiwan and, most likely, saturate the Taiwan Navy with barrages of ASCMs. In addition, B-6D bombers subordinate to the PLA Naval Air Force (PLANAF) are capable of firing the C-601/KRAKEN ASCM. The Navy's new FB-7 bomber likely will carry C-801/C-802 ASCMs. China's ASCM capability is expected to improve further with the planned acquisition of two Russian-built SOVREMENNYY-class destroyers armed with the SS-N-22/SUNBURN ASCM.

Taiwan Missile Defense. Taiwan's most significant vulnerability is its limited capacity to defend against the growing arsenal of Chinese ballistic missiles. These missiles pose a serious threat to non-hardened military targets, C2 nodes, and Taiwan's military infrastructure. As an initial response to this emerging threat, Taiwan has purchased the Modified Air Defense System (MADS), an improved variant of the PATRIOT surface-to-air missile (SAM) system which was used during DESERT STORM. The MADS, which began arriving on Taiwan in 1997, is expected to be deployed around heavily populated Taipei. Exclusive reliance on active missile defenses and associated BM/C3I, however, will not sufficiently offset the overwhelming advantage in offensive missiles which Beijing is projected to possess in 2005.

PLA Air Force. The PLA Air Force (PLAAF) currently numbers over 400,000 personnel with approximately 4,500 combat aircraft organized in some 30 air divisions. The PLAAF also maintains about 150 transport aircraft in two air divisions. The PLAAF inventory includes over 2,200 obsolete F-6/FARMER fighters, several hundred F-7/FISHBED and F-8/ FINBACK fighters, and over 40 Su-27/FLANKERS. In addition, it has some 500 A-5/FANTAN ground attack aircraft and about 500 bombers, including the obsolete B-5/BEAGLE. Both its aerial refueling and airborne early warning (AEW) programs are behind schedule, as are several of its indigenous aircraft development programs. By 2005, the PLAAF will possess nearly 2,200 tactical fighter aircraft, 500 ground attack aircraft, and 400 bombers, as older aircraft are retired. The majority of the mainland's air fleet still will be composed of second and third generation aircraft augmented by a limited number of fourth generation platforms. Command and control constraints and constricted airspace would limit the number of aircraft which the PLAAF could deploy at one time in an air battle over the Taiwan Strait.

Fighters. The F-10, China's first domestically-produced fourth-generation fighter, reportedly is still undergoing testing and evaluation. The aircraft most likely will be

armed with advanced beyond- visual-range (BVR), active radar (AR), air-to-air missiles (AAMs), and may be air refuelable. Domestic assembly of Su-27 kits has begun, with assistance from Russian technicians. Follow-on phases will involve assembly of an undetermined number of aircraft from a mixture of Russian- and Chinese- produced parts and, later, full domestic production of all but the aircraft's avionics and engine. The Su-27s originally purchased directly from Russia are the only fighter aircraft in the PLAAF inventory with sufficient combat radius to allow extended operations beyond China's borders. China will have made modest strides in its aerial refueling program by 2005. The F-8-II, other third generation aircraft modified to incorporate some fourth generation technology, as well as the F-10 are expected to possess aerial refueling capabilities.

Air-to-Air Missiles (AAMs). The PLAAF currently has in its inventory a number of AAMs which are superior to those in Taiwan's inventory. The Russian-built AA-11/ARCHER infrared (IR) AAM carried on the Su-27 is superior to Taiwan's AIM-9/SIDEWINDER and indigenously-produced *Tien Chien-I*/ SKY SWORD-I IR AAM. China's AA-10a/ALAMO missiles, on the other hand, are roughly comparable to, or slightly less capable than, Taiwan's AIM-7/SPARROWS. China's F-7 is capable of carrying the PL-2A and PL-5B IR AAMs, as well as the all-aspect PL-8 IR AAMs, while its F-8-IIs are capable of carrying the PL-2A, PL-5B, PL-8, and the BVR semi-active radar (SAR) PL-4 and PL-10 AAMs. All of these missiles are comparable to Taiwan's AAMs. By 2005, Beijing likely will have an AR AAM in its inventory and could adapt it for use on a larger number of platforms than Taipei could match. The PLAAF also is developing BVR AAMs for use aboard its fourth generation fighter aircraft.

Bombers. China's bomber aircraft include the B-6/BADGER and the B-5/BEAGLE. The B-5's slow speed and lack of standoff capability make this platform an extremely vulnerable target. The B-6 also is an aging aircraft. However, it is being produced in several versions. One variant is designed to carry an ASCM while another is being developed to carry an air-launched cruise missile (ALCM). The B-5 is being phased out of the inventory but it is still used in training and would probably be employed along with the B-6 bomber during a military conflict against Taiwan. However, both bombers would have limited success against Taiwan's air defense assets; the newer BADGER models incorporating cruise missile technology likely would have better success.

Transports. One of the PLAAF's combat missions is to provide airlift in support of PLA operations. However, until just recently, the PLAAF was unable to transport ground forces rapidly to distant parts of the country or sustain ground operations for extended periods due to antiquated aircraft and the lack of large-capacity aircraft. The PLAAF transport force now is capable of supporting the PLA at increased levels for a limited time and rapidly deploying to internal trouble spots. However, the PLAAF's current complement of large transport aircraft is limited to about a dozen IL-76MD/CANDIDS and about 50 Y-8/CUBs; the remainder of the transport force consists of smaller aircraft like the AN-24/COKE, AN-26/CURL, and Y-5/COLT. The

MD variant of the CANDID is a military model specially configured for airborne operations. Beijing can be expected to purchase additional Russian IL-76 or similarly-sized foreign aircraft. The ongoing expansion of China's civil aircraft fleet will allow the PLAAF to use the country's civil airlines to supplement its transport capability during crises.

Airborne. China's 15th Airborne Army consists of three airborne divisions, each with about 10,000 troops. The 15th is China's primary quick reaction force and has been designated as a strategic rapid reaction unit. However, China's airborne units remain handicapped by insufficient lift. Acquisition of additional aircraft and modern equipment, together with the increased emphasis on utilizing airborne forces during training exercises, will improve--albeit marginally--the 15th's combat capabilities.

Ground-Based Air Defense. Beijing is expending tremendous effort establishing an Integrated Air Defense System (IADS) at both the strategic and tactical levels. China's air defense technology currently lags behind western standards and its current IADS capability lacks many crucial components. Beijing probably could establish a fully operational national IADS within the next twenty years, but clearly not by 2005. China has a rudimentary tactical IADS capability in the form of its mobile Tactical Air Defense System (TADS).

Taiwan Air Force. The Taiwan Air Force (TAF) has about 70,000 personnel and over 400 combat aircraft. The current inventory includes approximately 180 older F-5E/F fighters and over 100 more modern Indigenous Defense Fighters (IDFs).

Fighters. The IDF has faced numerous developmental and operational problems since its inception in the 1980s. Nevertheless, its technical sophistication, with its fly-by-wire controls and blended wing-body design, is believed to be superior to any aircraft produced and deployed by China to date. Production of all 130 IDFs is scheduled to be completed by early 2000. Most of the IDFs are expected to be armed with the indigenously-produced, BVR *Tien Chien-II* (Sky Sword-II) AR AAM. Taiwan also has purchased 150 F-16 fighters from the United States: 120 single-seat "A" models and 30 two-seat "B" models. On-island deliveries, which began in April 1997, are continuing and should be completed by year's end. These aircraft are armed with upgraded AIM-7M/SPARROW SAR and AIM-9P4 and AIM9S SIDEWINDER IR AAMs. Deliveries of 60 French-built Mirage 2000-5s also began in April 1997 and were completed by October 1998. With its four MICA active radar (AR) and two MAGIC II infrared (IR) AAMs, the Mirage 2000-5 is Taiwan's most formidable air defense fighter. The TAF's current strategy is to employ the IDF for low altitude interception and ground attack; the F-16 for mid altitude offshore interception and ground attack; and, the Mirage 2000-5 for high altitude offshore interception. Taiwan also is planning an upgrade program for about 100 F-5 fighters. The systemic integration and generational problems that affect Taiwan's overall forces with respect to modernization apparently are having the greatest impact on the TAF, where the technology curve is highest.

Air Defense Early Warning. Taiwan has established an air defense early warning network which, when used in conjunction with its ground-based SAMs and fourth-generation tactical aircraft, appears to pose a credible deterrent against an air attack from the mainland. Taiwan has replaced its old SKY NET air defense network with a new network called STRONG NET to provide a comprehensive picture of the surrounding airspace.

Ground-Based Air Defense. The Improved HAWK (I-HAWK) SAM system remains the mainstay of Taiwan's air defense. It is a medium-range, low- to medium-altitude system, designed to defend fixed and mobile assets from high speed aircraft. The standard I-HAWK site consists of a pulse acquisition radar, a continuous wave acquisition radar, a high power illuminating target tracking radar, a range-only radar, and six three-missile launchers. Taipei also has deployed an indigenously-produced SAM--the *Tien Kung* or *Sky Bow*-- designed to replace the recently retired NIKE-HERCULES system. The *Tien Kung* is a medium-to-long range system, reportedly based on early versions of the U.S. PATRIOT. The *Tien Kung-I* is a single-stage, solid-propellant missile. It is deployed in two configurations: as a mobile, containerized system employing a quad-box launcher similar in appearance to the M901 PATRIOT missile launcher and as a fixed, silo-launched SAM. A follow-on variant, the *Tien Kung-II*, is configured as a fixed, two-stage, single-rail or silo-launched system. For target acquisition, tracking, and mid-course missile guidance requirements, the *Tien Kung* employs a multifunction, phased-array radar with associated fire-control computer system and a continuous wave dish antenna illuminator which are tied into the radar in order to allow multiple target engagement. As noted previously, Taiwan also has purchased the MADS, a variant of the PATRIOT SAM system, primarily to serve in an antiballistic missile role.

Short-range air defense coverage is provided primarily by the CHAPARRAL and the SKYGUARD systems. The CHAPARRAL consists of four modified AIM-9C SIDEWINDER missiles mounted on a tracked vehicle. The SKYGUARD is an integrated air defense system consisting of a modified AIM-7M/SPARROW AAM and a 35 mm AAA gun. Taiwan is expected to procure the STINGER/AVENGER SAM system. It is a pedestal mounted system with two pods--each with four STINGER missiles--mounted on the back of a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV). Taiwan's Chung Shan Institute of Science and Technology (CSIST) has developed and publicly displayed a new tactical air defense which it has dubbed the ANTELOPE. According to promotional brochures, work on the ANTELOPE began in July 1995 as a direct by-product of the *Tien Chien-I* IR AAM. According to CSIST, the ANTELOPE consists of a target acquisition system, communication components, an operational control system, a carrier, and four 18-km maximum range *Tien Chien-I* missiles. It can be used to intercept low-flying helicopters, fighter aircraft, attack aircraft, and bombers and can be installed on a midsize truck or HMMWV.

PLA Navy. The People's Liberation Army Navy (PLAN) currently numbers approximately 260,000 personnel, with over 50 destroyers and frigates, about 60 diesel and six Han- and Xia-class submarines, and nearly 50 landing ships. This force is complemented by several hundred auxiliary and smaller patrol vessels, as well as a naval air arm of over 500, mostly obsolescent, fixed-winged aircraft and some 30 helicopters. Over the last decade, the PLAN has streamlined and modernized its forces by eliminating large numbers of older ships and replacing them with fewer, more modern units. The number of submarines has declined by about one-half. The size of the major surface combatant fleet has been relatively stable, with older ships slowly being replaced by newer Chinese-built destroyers and frigates. Nearly all of the PLAN's inventory of U.S.-built, World War II-vintage landing ships have been replaced by similar numbers of domestically-produced vessels. Nevertheless, the PLAN continues to lag behind other regional navies, including that of Taiwan, in most technological areas, especially air defense, surveillance, and C4I.

Submarines. China maintains the overwhelming advantage in submarines over Taiwan and this quantitative advantage will continue through 2005. Moreover, while the number of boats in service in China is expected to decrease, their overall qualitative capabilities will increase. China is producing more modern submarines and is using submarine-related technology from Russia. Although the force is oriented principally toward interdicting surface ships using torpedoes and mines, China shortly will begin arming some of its submarines with a submerged-launch cruise missile. The capability of Chinese submarines to conduct ASW operations is expected to improve through 2005, in light of the acquisition of Russian-built KILO-class submarines and the greater emphasis being placed on ASW training. As a result, China's submarine fleet will constitute a substantial force capable of controlling sea lanes and mining approaches around Taiwan, as well as a growing threat to submarines in the East and South China Seas.

Surface Combatants. China's fleet of major surface combatants includes about 40 frigates and 20 destroyers. All carry ASCMs, ranging from the antiquated, first-generation CSS-N-1 / SCRUBBRUSH to the more advanced C-801/SARDINE and C-802/SACCADE. Two Russian-built SOVREMENNYY- class destroyers, which China is expected to acquire in the next several years, likely will be equipped with the SS-N-22/SUNBURN ASCM. The PLAN's surface fleet will continue to strive to enhance both its readiness and endurance for extended operations within the region and around Taiwan. It likely will conduct more realistic training exercises and deploy more advanced anti-ship and air defense missiles and electronic countermeasures.

Amphibious Forces. The PLAN's amphibious fleet provides sealift sufficient to transport approximately one infantry division. The PLAN also has hundreds of smaller landing craft, barges, and troop transports, all of which could be used together with fishing boats, trawlers, and civilian merchant ships to augment the

naval amphibious fleet. Shortcomings in long-range lift, logistics, and air support, however, hinders China's ability to project amphibious forces.

People's Liberation Army Naval Air Force (PLANAF). The missions of the PLANAF include protecting China's coastal airspace, providing air support for naval forces at sea, and, conducting maritime search and rescue operations. The PLANAF has only a limited maritime strike capability with some 150 non-strike B-6/BADGERS, A-5/FANTANS, and B-5/BEAGLES. However, these aircraft would be only marginally effective against most modern navies. Some of the approximately 30 B-6Ds provide the PLANAF with a cruise missile ship interdiction strike capability utilizing the C-601/ KRAKEN ASCM. The standoff-capable FB-7 fighter-bomber, equipped with the C-801/ASCM, will not become operational for another two to three years. It likely will augment the B-6 and eventually replace some of the B-5s and A-5s in the PLANAF's inventory.

Taiwan Navy. The Taiwan Navy has about 68,000 personnel and some 40 major surface combatants. In addition there are four submarines, about 100 patrol boats, 30 mine warfare ships, and 25 amphibious vessels. Despite the Navy's ability to refurbish and extend the service life of its vessels and equipment well beyond expectation, a large portion of the fleet consists of obsolescent World War II-era ships. The Navy's primary mission is to defend the island against a Chinese blockade and to protect Taiwan's sea lines of communication (SLOCs). The Navy's modernization program is intended to replace its aging fleet of surface combatants with newer ships like the French-built Lafayette-class frigate and a domestically-produced variant of the U.S. Perry-class frigate. Taiwan is acquiring advanced antisubmarine warfare technology which will likely improve their ability to counter PLA submarines operating off the coast of Taiwan.

Submarines. Taiwan has four submarines: two relatively modern Dutch-built ZVAARDVIS Design boats (*Hai Lung-class*) acquired in the late 1980s and two obsolete, World War II-era GUPPY II boats provided by the United States in 1973 for ASW training. The two Dutch submarines reportedly are armed with wire-guided torpedoes. The U.S. boats are used primarily as training platforms with a secondary mission to lay mines. Acquisition of additional submarines remains one of Taiwan's most important priorities.

Surface Combatants. Taiwan's naval modernization program--dubbed "Kuang Hua" or "Glorious China"--includes the licensed-production of eight Perry-class (*Cheng Kung-class*) frigates; the purchase of six Lafayette-class (*Kang Ting-class*) frigates from France; and, the lease of eight Knox-class frigates from the United States. Both the Perry-class and Lafayette-class frigates are armed with indigenously-produced *Hsiung Feng II* ASCMs, while the Knox-class frigates are equipped with the U.S.-made Harpoon ASCM. Air defense weapons systems include the Standard air defense missile on board the Perry-class frigates and the Sea Chaparral on board the Lafayettes. The primary mission of these newer frigates is sea control, particularly the capability to protect the sea lanes beyond the range of coastal aircraft.

The Navy also has more than a dozen older, World War II-era Gearing-class destroyers and numerous smaller combatants and auxiliaries in its operational inventory. The "Kuang Hua" program also includes the future acquisition of three types of smaller surface combatants: 12 *Jin Chiang-class* 580-ton guided missile patrol combatants; 10-14 1,500-2,000 ton corvettes; and, 50 fast attack missile boats (150-250 ton) to replace the aging fleet of *Hai Ou-class* boats currently in the inventory.

Taiwan Naval Air Force. Taiwan's small naval air force consists of 10 Hughes MD 500 short-range ASW helicopters, usually deployed aboard Taiwan's Gearing-class destroyers, and nine Sikorsky S-70C(M) ASW Thunderhawk helicopters, used with Taiwan's Perry- and Lafayette-class frigates. The 30 or so S-2T Tracker ASW/Maritime Patrol aircraft currently belonging to the TAF may be turned over to the Taiwan Navy in the future.

PLA Ground Forces. China's ground forces are comprised of approximately 75 army maneuver divisions. Approximately 20 percent of these divisions are designated "rapid reaction" units: combined arms units capable of deploying by road or rail within China without significant train-up or reserve augmentation. China is continuing the process of reducing the size of its army. The 500,000-man force reduction currently underway will streamline the force and facilitate funding to equip its "core" infantry, airborne, mechanized and aviation units with more advanced weapons. The army is supported by a large reserve-militia force numbering more than 1.5 million personnel and a one million man armed police force. Particularly since the 1991 Persian Gulf conflict, the PLA has devoted considerable resources to the development of special operation forces (SOFs). These units likely have been assigned specific missions and tasks in a variety of Taiwan contingencies, to include locating or destroying C4I assets, transportation nodes, and logistics depots; capturing or destroying airfields; destroying air defense assets; and, conducting reconnaissance operations.

Traditionally, China's ground forces have been highly cohesive, patriotic, physically fit, and well trained in basic skills. In addition, they are generally strong in operational and communications security, as well as in the use of camouflage, concealment, and deception. Major weaknesses are lack of transport and logistic support. Ground force leadership, training in combined operations, and morale are poor. The PLA is still a party army with nepotism and political/family connections continuing to predominate in officer appointment and advancement. The soldiers, for the most part, are semi-literate rural peasants; there is no professional NCO corps, per se. Military service, with its low remuneration and family disruption, is increasingly seen as a poor alternative to work in the private sector. China's leadership is aware of these weaknesses and is trying to address them in its overall modernization program. Thus, increasingly in the future, officers likely will be promoted on merit as opposed to connections, and the ratio of higher educated volunteer servicemen to conscripts likely will increase.

Taiwan Ground Forces. Taipei's approximate 220,000-member Army is organized and trained to defend Taiwan and the offshore islands against an invasion. About 80 percent of the Army's combat strength is on Taiwan proper, under the control of three field armies. The three offshore island commands--Chinmen, Matsu, and Penghu--have a total of more than 50,000 soldiers. In 1997, the Army began an aggressive restructuring campaign to upgrade its combat effectiveness, emphasizing rapid reaction capabilities, airborne invasion interdiction, and special forces operations. The plan apparently calls for trimming the force to 200,000 personnel. The three existing field armies will remain intact; however, the Army will eliminate divisions as operational units in peacetime. Existing infantry and mechanized divisions will be reorganized into specialized combined arms brigades. The Taiwan Army's equipment modernization effort has focused on improving mobility and fire power, primarily through the acquisition of tanks, helicopters, and short-range air defense missiles. Taiwan is acquiring over 450 M-60A3 medium tanks; they will join an already large tank force consisting of some 450 M-48H and 300 M-48A5 medium tanks and over 1,000 much older M-41 and M-24 light tanks. Taiwan also has acquired 42 AH-1W Cobra attack and 26 OH-58D Kiowa scout helicopters.

China - Information Operations.

Information Warfare. China's information warfare (IW) program is in the early stages of research. It currently focuses on understanding IW as a military threat, developing effective countermeasures, and studying offensive employment of IW against foreign economic, logistics, and C4I systems. Driven by the perception that China's information systems are vulnerable, the highest priority has been assigned to defensive IW programs and indigenous information technology development. Some technologies could provide enhanced defensive or offensive capabilities against Taiwan military and civilian information infrastructure systems. Computer anti-virus solutions, network security, and advanced data communications technologies are a few examples. Chinese open source articles claim that the PLA has incorporated IW-related scenarios into several recent operational exercises. Efforts have focused on increasing the PLA's proficiency in defensive measures, especially against computer viruses.

Computer Warfare. In the area of Computer Network Attack, China appears interested in researching methods to insert computer viruses into foreign networks as part of its overall Information Operations (IO) strategy. Beijing reportedly has adequate hardware and software tools and possesses a strong and growing understanding of the technologies involved. China's strategic IO use of advanced information technologies in the short- to mid-term likely will lack depth and sophistication; however, as it develops more expertise in defending its own networks against enemy attack, it is likely to step up attempts to penetrate adversarial information systems.

Electronic Warfare. The thrust of China's electronic warfare (EW) efforts continues to focus on technology development and design capabilities improvement,

accomplished mainly through cooperation with Western companies, through reverse engineering efforts, and through the procurement of foreign systems. The inventory of Chinese EW equipment includes a combination of 1950s-1980s technologies, with only a few select military units receiving the most modern components. China is procuring state-of-the-art technology to improve its intercept, direction finding, and jamming capabilities. In addition to providing extended imagery reconnaissance and surveillance and ELINT collection, Beijing's unmanned aerial vehicle programs probably will yield platforms for improved radio and radar jammers. Additionally, existing earth stations can be modified to interfere with satellite communications. Finally, the PLA is developing an electronic countermeasures (ECM) doctrine and has performed structured training in an ECM environment.

Antisatellite (ASAT) Programs. China currently can detect and track most satellites with sufficient accuracy for targeting purposes. Beijing's only current means of destroying or disabling a satellite, however, would be to launch a ballistic missile or space launch vehicle armed with a nuclear weapon. Press articles indicate Chinese interest in a laser ASAT. Beijing apparently has research programs involving the relevant technologies, and already may possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers.

Sensors for Detection and Targeting. China currently is acquiring and developing new systems which will give it a variety of targeting capabilities it currently lacks. Detection and targeting will improve over time, as space-based sensors are launched; long distance reconnaissance drones are produced; and, AEW aircraft are put in service. Beijing reportedly is developing several reconnaissance satellites which could provide initial targeting data to long-range reconnaissance aircraft. The acquisition of an AEW platform capable of conducting data relays has held a high priority in the PLAAF's efforts to modernize. Beijing is expected to acquire several PHALCON AEW systems mounted on IL-76 airframes. The Chinese Navy also reportedly is acquiring Skymaster AEW radars. While Chinese officials claim these radars will be used for search and rescue operations, they could be used in AEW and surface surveillance roles. China conceivably could have fully operational AEW platforms by 2005. By 2000, Beijing will have access to commercial remote sensing overhead imagery in the 2.5 meter resolution range. Access to new overhead imagery platforms in the near term will enhance China's ability to map, surveil, and target. The Chinese already have had access to commercial satellite imagery from the French SPOT satellites, Indian IRS-1c satellite, Canadian RADARSAT, and various Russian satellites. This widely available commercial satellite imagery can be used to develop digital terrain maps for targeting, missile guidance, and mission planning.

Telecommunication Infrastructure. China's telecommunications infrastructure, composed of both civil and military communications networks, currently is being modernized. China's C4I infrastructures, supporting all levels of military and

civilian leadership, are receiving specific attention. The PLA communications network supports all branches of the armed forces and uses the same types of communications mediums as the civil network. Multiple transmission systems create a military communication system that is survivable, secure, flexible, mobile and less vulnerable to exploitation, destruction or electronic attack. Thus, while China's command and control networks could be degraded, it is unlikely that they could be denied. Overall, network performance is assessed as adequate. The military's lack of communications satellites could force the PLA to rely on foreign satellite services to meet military needs in wartime or a crisis. In the event of crisis, it is believed the military would preempt the domestic satellite systems for combat operations. Within the operational forces, mobile communications equipment probably will be fielded in greater numbers to maneuver units and increasingly will incorporate features such as encryption and frequency hopping. As a result, the PLA leadership eventually will be able to control its forces in a much more secure and timely manner over a wider and more dynamic range of missions than is currently possible.

Deception. The PLA's modernization program includes improving military denial and deception doctrine and capabilities for use against potential adversaries at the strategic, operational, and tactical level. Recent Chinese military writings affirm that "high technology warfare" requires developing denial and deception techniques for countering U.S. precision weapons, advanced reconnaissance sensors, and command and control warfare doctrine. A 1993 Chinese National Defense University treatise, *High Technology and Military Camouflage*, suggests that the PLA recognizes the value of conducting deception operations, especially in a crisis involving Taiwan, to create ambiguity about Chinese intentions and force the Taiwan political and military leadership to misallocate resources. According to this study, "deception is intended to induce the enemy to reach erroneous conclusions about the activities, deployment, and combat objectives of our forces. Camouflage and deception can disperse the enemy's troops, waste their firepower, and disrupt their high technology weapons."

Psychological Operations. The PLA historically has made extensive use of psychological operations (PSYOP) in all its military campaigns and has integrated PSYOP into its national military strategy. China is believed to have a robust capability to conduct PSYOP against Taiwan. Moreover, prominent articles on PSYOP in the *Liberation Army Daily* over the last few years indicate that the PLA is committed to improving its PSYOP capability. In earlier military campaigns--such as China's prolonged confrontation with Taiwan military forces on the offshore islands in the 1950s and 1960s and China's brief border war with Vietnam in 1979--the PLA demonstrated that it has a range of techniques for disseminating PSYOP messages to opposing military forces and civilian populations. During these conflicts, PLA PSYOP units employed loudspeakers, leaflets, posters, and radio broadcasts to spread propaganda messages. China also has demonstrated in past conflicts that it is not averse to using "black" propaganda and disinformation campaigns based on specious assertions and fabricated evidence. Perhaps the best

example of this was the "germ warfare" propaganda campaign that was aggressively pursued by Chinese propagandists during the Korean War. This massive PSYOP campaign attempted to convince an international audience that U.S. forces, in collusion with Japan, were spreading biological toxins in Korea and China.

Taiwan - Information Operations.

Information Warfare. As one of the world's largest producers of computer components, Taiwan has all of the basic capabilities needed to carry out offensive and defensive IW related activities, particularly computer network attacks and the introduction of malicious code. While information on formally integrating IW into warfighting doctrine is not available, there are indications that formal doctrine development to guide future employment of these capabilities may be in progress. As new computer systems and technology are developed and as Taiwan increases its role in the manufacture of these systems, its capability to exploit its position for IW activities can be expected to increase substantially.

Computer Warfare. Taiwan has demonstrated a significant knowledge of viruses. A virus known as "Bloody" or "6/4" protesting the Tiananmen Square crackdown was first discovered in Taiwan in 1990. In 1992, personnel from The Hague--with support from INTERPOL--investigated the dissemination of the "Michelangelo" virus by a Taiwan firm. In 1996, Taiwan virus writers developed and distributed a computer virus protesting Japanese claims to the Diaoyutai Islands. The following year, opponents of the Taiwan government developed a widely circulated Word-macro virus known as "Con-Air" which protested social problems on the island. Taiwan also is well known for the efforts by researchers and corporations to combat computer viruses. Trend Micro--formerly known as Trend Micro Devices--is an industry leader in anti-virus software and, to a lesser extent, other network security products. Trend Micro was the first company to develop a response to the "Michelangelo" virus; it currently dominates the anti-virus software market in Japan. Trend Micro also has led in the area of virus recognition technology. Taiwan's Academia Sinica also has made impacts in the area of anti-virus software development.

Sensors for Detection and Targeting. During the 1980s, Taiwan's reconnaissance capability and 1970s vintage photographic technology was adequate for the limited capabilities and low threat posture of the PLAAF. Taiwan's airborne reconnaissance capability, however, began to decline precipitously in the 1990s. Last year, the TAF retired the last of its RF-104G tactical reconnaissance aircraft and replaced them with reconnaissance-configured RF-5E aircraft. Taipei continues to seek a new imaging system capable of exploiting targets at greater distances from the coast, but without exposing its reconnaissance flights to China's increasingly more sophisticated air defenses. Taiwan conducts technical and human intelligence operations against China and purchases French SPOT and U.S. LANDSAT commercial imagery for exploitation.

Telecommunications Infrastructure. Taiwan's telecommunications infrastructure is composed of a civilian communications system and a separate military communications system. The civilian system consists of a nationwide network of fixed telephone lines (coaxial and fiber optic), microwave, wireless (satellite, cellular, paging), and TV and radio broadcast. The military system reportedly also consists of a nationwide network of fixed telephone lines (coaxial and fiber optic) and microwave, as well as satellite, troposcatter and HF/VHF radio. Taiwan is rapidly developing its telecommunications infrastructure with the goal of becoming an Asia-Pacific telecommunications hub. The Taiwan military could benefit from any improvements to the commercial architecture. In the past, satellite communications have played a relatively minor role in domestic communications; they were used primarily to link Taiwan to its offshore islands. INTELSAT provides this domestic function as well as international connections for Taiwan. Satellite communications using very small aperture terminals (VSAT) were placed into commercial service in 1989. Satellites may begin to play a more prominent role both domestically and internationally with the advent of a number of new satellite systems. Taiwan also is working on building its own satellites under the ROCSAT program. ROCSAT-1, which will include an experimental communications package, is scheduled to be launched in January 1999.

Psychological Operations. Taiwan reportedly possesses a well-developed PSYOP capability, under the auspices of the General Political Warfare Department (GPWD). During previous periods of tense confrontation across the Taiwan Strait, the GPWD has demonstrated its ability to employ a wide variety of PSYOP techniques, including broadcasting propaganda messages; using balloons, kites, artillery shells, and various flotation devices to deliver propaganda messages; and, offering financial inducements to potential defectors. China's leadership reportedly is considered an especially hard target for Taiwan's PSYOP forces. Given the continuous attention the Chinese military leadership has given to the indoctrination of its forces, PLA troops also are not likely to be susceptible to Taiwan PSYOP.

China - Other Factors.

Military Leadership. The PLA does not approach leadership in the same way as Western military forces, placing greater emphasis on technical skills than on leadership development. The PLA's leadership culture is also risk averse, favoring the status quo over change. Historical experiences and decades of Communist propaganda have made the majority of Chinese military leaders suspicious of the outside world and its attitudes toward China's increasing power and influence. Relatively few senior officers have travelled abroad, although the military has undertaken a significant military diplomatic effort since the early 1990s that is overcoming this deficiency. The result of this physical and intellectual isolation has been the development of a strongly nationalistic outlook among the officer corps that could color negatively the leadership's approach to international developments seen impacting China's sovereignty or security.

China's military leadership is united on its desire to acquire or improve selected military capabilities in the near term. In the longer term, military leaders want to overhaul significantly the entire armed forces to create a smaller, technically more advanced instrument to fight in the immediate vicinity of China's borders. There also is a corresponding emphasis on military professionalism in China. While the political commissar system still exists and political officers share joint command with their operational brethren, the military now emphasizes operational training over political indoctrination. This trend will create a less politicized officer corps, especially among junior and mid-grade officers. It also will move the military leadership toward forming a more corporate military identity.

Senior Chinese officers are studying modern technological advances and how these can best be incorporated into the current and projected military doctrine and structure. These officers are still generally more familiar and comfortable with an operational level of conflict that relies primarily on ground forces to achieve objectives. Below the most senior level, an increasing number of officers in command positions are conversant in, and somewhat experienced with, modern technological and operational concepts like joint operations. Nevertheless, the military has recently renewed its emphasis on upgrading scientific and technical education in order to overcome perceived deficiencies in the officer corps in this respect.

Training. In recent years, China has shown a growing willingness to experiment with new aspects of training. Training has become more realistic and challenging, with an increased participation by opposition force units and greater emphasis on combined arms. Although intraservice training at the tactical level is improving, joint exercises are still tightly controlled and indicative of the difficulty the PLA likely would have in executing operational-level battle plans. While this past year's summer floods disrupted training for a large percentage of the PLA, certain exercises were not cancelled, particularly those emphasizing Beijing's commitment to improve joint training.

Professional Military Education. Professional military education for both officers and NCOs in the PLA is a high priority for Beijing. Institutional structures designed to instill a high degree of professionalism throughout the force were conspicuously absent in China until 1978, when the PLA began to address educational shortfalls. Since that time, Beijing has established a number of educational institutions throughout the military, although the emphasis remains on the officer corps.

The key organization shaping the professional development of the senior PLA officer corps is the National Defense University (NDU). It instructs senior officers in areas such as strategic studies, operational art, organizational command and management, combined arms and joint service operations, foreign military studies, and logistics. The NDU also provides information and advice on military modernization and broad strategic issues to national-level organizations; it also

performs research on various strategic and operational military issues. The second tier in the PLA's officer education system consists of military colleges and academies which prepare field grade officers for regimental-level command and address the fundamentals of joint and combined arms operations. The curriculum concentrates on company, battalion, and regimental tactics. In addition, the schools teach basic joint operations. A small number of schools also trains students in specialty staff duties, such as engineering and communications. The lowest tier of officer education is provided by military colleges and academies for junior officers and mid-rank officers; they provide multiple avenues for undergraduate and general military education. The curriculum consists of three and four year undergraduate programs and a two year vocational program. The majority of the cadets are upper middle school graduates.

The PLA's NCO Corps is in its infancy, having been established only in the late 1980s. Chinese NCOs--former conscripts who are allowed to remain on active duty following their initial enlistment --are classified as either "master sergeants" or "technical sergeants." Newly selected NCOs attend a six month training program at the MR academies. Training is limited to tactics for the master sergeants and technical subjects for the technical sergeants. Beijing has not yet established formal education programs for NCOs beyond their initial training.

Joint/Integrated Operations. The PLA conducts interservice exercises at the tactical level, but the services are not fully integrated into a cohesive combat force. Disparate elements train simultaneously and in proximity, but do not appear to be controlled at the operational level by a joint commander and staff. Ground and air components exercise together with regularity and are improving their interoperability. Integration of ground and naval forces, however, is rarely exercised, particularly at the operational level, where synchronization and command and control are of greatest importance in the conduct of complex operations. The navy is beginning to conduct more combined operations between ships and naval aircraft. The PLA also is looking into the possibility of instituting a "joint command" structure at the operational or theater level, similar to that of the U.S. military. Accordingly, a commander would exercise operational control over all military forces assigned to and deployed in a particular area. These "joint commands" likely would be given specifically assigned missions in response to particular threats or security requirements.

Morale. Morale within the PLA, particularly among enlisted personnel, is assessed as generally low. Problems of desertion, declining relations between officers and troops, reluctance to train with obsolete equipment, high consumption spending by officers, anti-corruption audits which restrict outside earnings, and food shortages have been reported in the Chinese press. Low pay in comparison to other segments of Chinese society is a key factor. The PLA's involvement in business--at least until just recently when it was directed to divest itself of its commercial interests--also distracted many of its more competent officers from their military duties. Some Chinese military leaders believe that many of the morale problems can be solved by

increased pay and allowances, further professionalization of the force, and improved quality of life.

Logistics and Sustainability. The PLA's logistics structure and doctrine still reflect, for the most part, the decades-long focus on fighting a large-scale ground conflict, wherein a MR commander would conduct autonomous combat operations over an extended period. The logistics infrastructure developed to support such regional operations is highly decentralized, based on interior lines of communication, and optimized to depend on local depots and stockpiles for resupply. MR commanders apparently were given broad leeway to develop region-specific logistics management procedures. These practices have inhibited the implementation of PLA-wide standards, since the separate management systems made interregional operations virtually impossible. In recent years, the PLA has devoted attention to improving its logistics support to military operations in a Taiwan scenario--operations which would include a higher tempo of operations and use of high technology weapons and equipment. It reportedly has automated many inventory control processes, streamlined procurement, and improved mechanisms for getting supplies to deployed troops. While these developments appear to offer a modest capability to support some types of military operations in the region, the PLA has made only incremental improvements in its ability to support a large-scale, long-term, high optempo engagement.

Taiwan - Other Factors

Military Leadership. Overall, Taiwan's military leadership is competent and capable. Taiwan officers of all services and ranks exhibit a relatively high degree of professionalism. They generally are well educated, operationally proficient, and technically sophisticated--especially when contrasted with their PLA counterparts--and pro-U.S. in their outlook. Balanced against these attributes, the officer corps functions within a culture that values caution over innovation and initiative. Junior officers are familiar with technological improvements but recent modernization efforts will challenge their management skills and may require adjustments to unit training and operational tempos. The Taiwan military will face an ongoing challenge in retaining qualified junior officers as employment opportunities in the civilian sector remain enticing. The increased importance of technology in modern warfare has led to an increased emphasis in Taiwan on modernizing the technology-intensive services, namely the Air Force and Navy. While Army officers continue to dominate the senior leadership positions within the defense hierarchy--the Army comprises more than 50 percent of the armed forces--the emphasis on the Air Force and Navy may lead to a corresponding rise in the influence of air and naval officers over matters such as defense procurement priorities and employment doctrine. Taiwan President Lee Teng-hui strongly supports the promotion of native Taiwanese officers to senior military positions. Currently, the Chief of General Staff and commanders of the air force and marines are ethnic Taiwanese. This trend will continue and probably will have a positive

effect on the morale and cohesion of the lower ranks of the armed forces, who themselves are overwhelmingly native Taiwanese.

Training. Taiwan's large-scale training normally takes place quarterly with the major training centers hosting limited maneuver and live-fire exercises. *HAN KUANG 14*, conducted in mid-May 1998, was one of Taipei's more typical joint exercises to date. Primarily a C4I exercise, the training was of very short duration and the scenario allowed for only limited exercise play. Taipei scheduled another "joint exercise" on 12 October 1998, but then cancelled it as a "goodwill gesture" toward Beijing in the run-up to the resumption of high level cross-Straits talks on 14 October. A dress rehearsal on 7 October also was cancelled, although a "preliminary dress rehearsal" was held on 2 October. It consisted of a series of live-fire demonstrations showcasing some of Taiwan's most modern military equipment.

Professional Military Education. Professional military education of Taiwan's officer corps is conducted along two developmental lines: the *universal* track for regular career officers and the *professional* track for officers in specialized fields like political affairs, medicine, and engineering. The *universal* track is the general military education for officers provided at the three service academies. Graduates receive a bachelor's degree after completing 130 university-level credit hours. The Naval Academy concentrates on science and engineering, while the Air Force Academy curriculum focuses on aerospace-related courses and includes supervised flight training beginning in the second year. Newly commissioned Army officers go on to branch schools, i.e., infantry, army, and artillery. Education in the *professional* track is conducted at such specialized schools like the Fu Hsing Kang College, the Defense Medical College, the Defense Management College, and the Chung Cheng Institute of Technology. Mid-career and senior career professional military education is conducted at the Armed Forces University (AFU). Tracing its roots back to 1906, AFU is the highest level institution in the Taiwan military education system. It is responsible for training strategic-level command and staff officers, as well as specialists in defense administration and military intelligence. It also conducts research into the development of war strategies and political warfare. AFU includes four colleges: the War College for senior field grade and general officers and the Command and Staff Colleges of the Army, Navy, and Air Force for junior field grade officers.

Morale. Morale, especially among the enlisted ranks, is generally assessed as poor, amidst efforts to retain competent, educated service members in the face of stiff private sector competition. The military competes poorly with the civilian economy in attracting Taiwan's youth, especially those who are technically-oriented. Continued personnel shortages stemming from low retention rates-- especially among NCOs--will remain a serious problem affecting morale. The military also is hampered by systemic problems of poor, antiquated management and a traditional military culture with very rigid command structures which discourages lower-level risk-taking, decisionmaking, and innovation. The Taiwan Army especially is facing morale problems stemming from the ongoing restructuring and downsizing.

While the operational outlook and overall morale of TAF pilots is significantly better than that of PLAAF pilots-- largely due to better training opportunities and exposure to and hands on experience with more modern Western equipment--there exists a disparity between the military and civil aviators in pay and benefits, which inevitably affects morale.

Logistics and Sustainability. Taiwan's logistics capability will support some defensive operations on Taiwan, but its probability of success is highly dependent on the tempo of operations. The military reportedly is trying to make the logistics system more efficient to better support combined or joint force operations. In the interim, logistics support will remain cumbersome--but effective--for localized engagements. Taiwan's defenses rely heavily on air and naval forces, both requiring an extensive maintenance and repair infrastructure to support weapons systems and equipment. The critical requirements are major equipment end items like engines and transmissions, ammunition, fuel and especially obsolete spare parts which no longer are being manufactured.

IV. THE DYNAMIC BALANCE

Currently, China's more than 2.5-million-man PLA dwarfs Taiwan's defense force of about 400,000. In most cases, equipment totals also are lopsided. Only a portion of this overall strength, however, could be brought to bear against Taiwan at one time. China has nearly 4,500 combat aircraft, as compared with some 400 on Taiwan. The Chinese Navy has about 65 attack submarines--five of which are nuclear powered--as compared with four diesel attack submarines for Taiwan. China has over 60 major surface combatants while Taiwan has no more than 40. China has nuclear weapons and a ballistic missile force that can deliver nuclear or conventionally-armed warheads against Taiwan. In terms of the quality of their military equipment, however, Taipei possesses an edge over Beijing, as new weapons systems--particularly fighter aircraft and naval frigates--are entering the inventory.

Should China decide to use military force against Taiwan, there are several options or courses of action available to Beijing, including--but not limited to--an interdiction of Taiwan's SLOCs and a blockade of Taiwan's ports, a large-scale missile attack, and an all-out invasion.

Blockade. The primary intent behind a blockade of the island would be to cripple Taiwan economically and isolate it internationally. China's leaders apparently believe that this option would be less likely to provoke outside intervention than others. Beijing probably would choose successively more stringent quarantine-blockade actions, beginning with declaring maritime exercise closure areas and stopping Taiwan-flagged merchant vessels operating in the Taiwan Strait. Operations likely would include mine laying and deploying submarines and surface ships to enforce the blockade. Barring third party intervention, the PLAN's quantitative advantage over Taiwan's Navy in surface and sub-surface assets would

probably prove overwhelming over time. Taiwan's military forces probably would not be able keep the island's key ports and SLOCs open in the face of concerted Chinese military action. Taiwan's small surface fleet and four submarines are numerically insufficient to counter China's major surface combatant force and its ASW assets likely would have difficulty defeating a blockade supported by China's large submarine force. The PLANAF's B-6D bombers armed with C-601 ASCMs would place Taipei's merchant ships and combatants at serious risk.

Missile Strikes. Within the next several years, the size of China's SRBM force is expected to grow substantially. An expanded arsenal of conventional SRBMs and LACMs targeted against critical facilities, such as key airfields and C4I nodes, will complicate Taiwan's ability to conduct military operations. By 2005, China will have deployed both the CSS-6 and CSS-7 SRBM. In addition, the PLA could have a first generation, air-launched LACM in its inventory. Should Beijing choose escalation, a rapid transition from relatively low-intensity blockade operations to massive missile strikes would be a likely step, particularly as a pretext to an invasion. These missile attacks most likely would be high-volume, precision strikes against priority military and political targets, including air defense facilities, airfields, Taiwan's C2 infrastructure, and naval facilities. China, however, could encounter problems coordinating missile firings with other concurrent military operations, such as air and maritime engagements. Exclusive Taiwan reliance on active missile defenses and associated BM/C3I, however, will not sufficiently offset the overwhelming advantage in offensive missiles which Beijing is projected to possess in 2005.

Air Superiority. Maintaining air superiority over the Taiwan Strait would be an essential part of any Chinese effort to mount a military operation against Taiwan. China currently has an overwhelming quantitative advantage over Taiwan in military aircraft and will retain that advantage beyond 2005. On the other hand, Taiwan's more modern aircraft will provide it with a qualitative advantage that should be retained at least through that period. PLA electronic warfare operations against air defense radars, disruption of command and control networks, and/or large scale conventional SRBM and LACM strikes against airfields and SAM sites would reduce the effectiveness of Taiwan's air defenses.

The future effectiveness of the TAF will depend on the implementation of sound pilot training, sufficient logistic and maintenance support, and the ability of the TAF to integrate satisfactorily several disparate airframes into a cohesive, operational fighting force.

For its part, Beijing is faced with similar training, maintenance, and logistics challenges, complicated further by a still questionable capability on the part of its aerospace industry to keep pace with rapidly evolving technologies. Nevertheless, while the majority of the mainland's air fleet will still be composed of second and third generation aircraft, the sheer numerical advantage of older platforms augmented by some fourth generation aircraft could attrit Taiwan's air defenses sufficiently over time to achieve air superiority.

Amphibious Invasion. An amphibious invasion of Taiwan by China would be a highly risky and most unlikely option for the PLA, chosen only as a last resort to force the total surrender of the island. It most likely would be preceded by a variety of preparatory operations to include a blockade, conventional missile strikes, and special operations on Taiwan. These operations would play a critical role in determining how China would pursue the *coup de grace*, with an amphibious assault only one facet of a multi-pronged invasion plan. Beijing's amphibious lift capability is extremely limited at present and there are no indications that China is devoting resources to improve significantly its amphibious assault capability. As a result, success only would be achieved with a massive commitment of military and civilian assets over a long period of time and without third party intervention; furthermore, an invasion would bring almost certain damage to China's economy and its diplomatic interests, especially in the Asia-Pacific region.

The first move in an invasion plan likely would be a SLOC/blockade interdiction operation. The PLAAF and PLANAF would try to establish an air defense umbrella over the Taiwan Strait in preparation for local air superiority operations. Ground-based air defense assets would deploy forward and be integrated into the umbrella. Naval surface actions groups would begin operations near Taiwan's major ports. Announced missile closure areas and port mining by submarines would be designed to canalize traffic and force Taiwan naval vessels into engagement areas. Ground force mobilization likely would begin and PLA combat air patrols over the Taiwan Strait would intensify. Invasion operations would follow sufficiently close on the heels of conventional missile attacks to prevent Taipei from repairing and reconstituting damaged facilities. As the PLA's amphibious lift capacity in 2005 would still be limited, an amphibious over-the-beach assault would be extremely problematic. Rather, airborne, airmobile, and special operations forces likely would conduct simultaneous attacks to the rear of Taiwan's coastal defenses to seize a port, preferably in close proximity to an airfield. Seizing a beach-head likely would constitute a supporting attack. An airborne envelopment would facilitate amphibious operations by cutting off Taiwan's coastal defenders from supply lines and forcing them to fight in two directions.

Beijing's suppression of Taiwan's air defenses would be followed rapidly by a "second-wave" air attack which would attempt to establish air superiority over an invasion corridor in the Taiwan Strait. Priority for air defense protection and fighter escort operations would shift from bombers carrying ASCMs to fixed- and rotary-wing transports ferrying additional airborne and airmobile assault forces. Both China's amphibious fleet and a large portion of its huge merchant fleet would complete rapid reaction unit upload operations and depart from ports along the central coast. China also likely would saturate the Taiwan Strait with a huge number of noncombatant merchant and fishing vessels, with the aim of confusing and overwhelming Taipei's surveillance and target acquisition systems. The PLA's success in establishing and maintaining a foothold on the island would rest on a variety of intangibles to include personnel and equipment attrition rates on both

sides of the Strait; the interoperability of PLA forces; and the ability of China's logistic system to support adequately optempo operations.

In order for an invasion to succeed, in other words, Beijing would have to possess the capability to conduct a multi-faceted campaign, involving air assault, airborne insertion, special operations raids, amphibious landings, maritime area denial operations, air superiority operations and conventional missile strikes. The PLA likely would encounter great difficulty conducting such a sophisticated campaign by 2005. Nevertheless, the campaign likely would succeed--barring third party intervention--if Beijing were willing to accept the almost certain political, economic, diplomatic, and military costs that such a course of action would produce.

Information Dominance. The Chinese currently are focusing on eliminating specific deficiencies they have in both areas of IO/IW technology and training. The PLA is engaged in efforts to improve the staff planning process by applying joint forces concepts learned from studying foreign IO/IW doctrine. Recent IO/IW military exercises claim to have included computer network attack and defend exercises. Public disclosure of these IO/IW exercises serves as an informational tool for the PLA to the future importance of IO/IW in Chinese military doctrine and reaffirms China's intent to continue developing and improving its IO/IW capability. In spite of these activities, the Chinese have many challenges to overcome and Beijing's ability to paralyze Taiwan's command and control appears limited at best.

On the other side of Taiwan Strait, IO may be an attractive--but untested tool--in multiplying the effectiveness of Taiwan's military forces. As one of the world's largest producers of computer components, Taiwan has all of the basic capabilities needed to carry out offensive IO-related activities, particularly computer network attacks and the introduction of malicious code. Formal doctrine development to guide future employment of these capabilities already may be in progress. As Taiwan increases its role in the manufacture of new computer warfighting systems, Taipei's capability to exploit its position for IO activities can be expected to increase substantially.

V. CONCLUSIONS

During the twenty-year period from 1979 to 1999, the security situation in the Taiwan Strait has exhibited simultaneously both significant change in some respects and remarkable constancy in others. The greatest change has occurred in the political and diplomatic arenas, a reflection of the political changes which have taken place in both Beijing and Taipei, and between Beijing and Taipei. On the other hand, despite the modest qualitative improvement in the military forces of both China and Taiwan, the dynamic equilibrium of those forces in the Taiwan Strait has not changed dramatically over the last two decades, except in a few niche areas like China's deployment of SRBMs.

Despite anticipated improvements to Taiwan's missile and air defense systems, by 2005, the PLA will possess the capability to attack Taiwan with air and missile strikes which would degrade key military facilities and damage the island's economic infrastructure. China will continue to give priority to long-range precision-strike programs. Similarly, despite improvements in Taiwan's ability to conduct ASW operations, China will retain the capability to interdict Taiwan's SLOCs and blockade the island's principal maritime ports. Should China invade Taiwan, such an operation would require a major commitment of civilian air and maritime transport assets, would be prolonged in duration, and would not be automatically guaranteed to succeed. In the end, any of these options would prove to be costly to Beijing--politically, economically, diplomatically, and militarily.

Beyond 2005, development of a modern military force capable of exerting military influence within the region, achieving deterrence against potential enemies, preserving independence of action in domestic and foreign affairs, protecting the nation's economic resources and maritime areas, and defending the sovereignty of the nation's territory will remain one of China's national priorities. Beijing will strive to create a smaller, more modern, better trained, more professional, and better logically supported force, with an emphasis on air, naval and missile forces. China will continue to improve its regional force projection capabilities, but will not possess the conventional military capabilities to exert global influence.

The PLA will field large numbers of increasingly accurate SRBMs and introduce LACMs into its inventory. China's naval forces will continue their transition from a large coastal defense force to a smaller, more modern force able to conduct limited sea control operations against regional opponents in the East and South China Seas. China's air force will continue to assimilate greater numbers of fourth generation aircraft into its inventory, upgrade its regional IADS, and expand its airborne refueling and AEW capabilities. China will retain a numerical advantage over Taiwan in terms of both personnel and weapons.

On the other side of the Taiwan Strait, by 2005, Taipei will possess a qualitative edge over Beijing in terms of significant weapons and equipment. The TAF will have over 300 fourth generation fighters. Six French-built Lafayette-class frigates, eight U.S. Knox-class frigates, and eight Perry-class frigates will form the nucleus of Taiwan's naval force. Taiwan will possess an advanced air defense network, comprising an AEW capability, an automated C2 system, and several modern SAM systems, which will provide Taiwan with an enhanced defensive capability against both aircraft and missiles. The mobility and firepower of Taiwan's ground forces will have been improved with the acquisition of additional tanks, armored personnel carriers, self-propelled artillery and attack helicopters.

Taiwan's primary security goal beyond 2005 will be to maintain the status quo, while retaining its long-term objective of eventual peaceful reunification with China on terms favorable to Taipei. Taiwan will seek to advance its international status, maintain a strong economy, modernize its military forces, and further democratize

the island's political system. At the same time, Taipei will endeavor to expand political, cultural, and economic ties with Beijing, thereby reducing tensions with China and lessening the prospects of military conflict in the Taiwan Strait. Taiwan's military strategy will remain defensive. Its success in deterring potential Chinese aggression will be dependent on its continued acquisition of modern arms, technology and equipment and its ability to deal with a number of systemic problems -- primarily the recruitment and retention of technically-qualified personnel and the maintenance of an effective logistics system--lest Taipei once again risk losing its qualitative edge.